

ITS4US Safety Management Plan Training Session Transcript (05-04-21)

Speaker: Karen Timpone

Good afternoon everybody.

I guess the next slide is my introduction of who I am.

But let's say today's training for Complete Trip ITS4US sites is focused on the development of the Safety Management Plan under task four which focuses on systematically identifying safety needs associated with the project.

Identifying risk based operational concepts to reduce the likelihood and potential impact of safety.

Well, there is a picture of me that looks a lot better than what I look right now. I got caught in the rain this morning.

My name is Karen Timpone and I'm with the Federal Highway Administration.

I work in the Office of Safety and my primary job is connected and automated vehicles, and I do a lot of vehicle pedestrian projects for the Office of Safety in conjunction with the ITS Joint Program Office.

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Just looking through the list, I don't think there is anybody really who has not been in part of these trainings.

So the first bullet on the agenda, the brief overview, we will just quickly go through those slides and then we will get into the meat of the program.

We will talk about safety management.

The training aims to help the sites develop their task for the safety management plan.

These bullets provide a high-level list of items that are expected in the safety management plan and will be discussed during the training.

At the end of the training session we will share some resources that can be helpful and then address any questions that you may have.

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So all of you have seen this famous slide. It basically is just talking about the vision and the Complete Trip ITS4US program. So let's move on.

Right here are the five program goals which all of you should know pretty extensively since you answered all of these in order to start developing your project.

So I'm not going to really spend time going through that.

You can take a look at this on your own.

I believe everybody has a set of the slides.

And we all know who all the projects are.

You know, the five projects in the United States, so I don't think there is any sense in spending time on that.

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And here we are in the deployment phases and we all know that we are working on the concept deployment and that information will feed us into the testing and design and then the operation and evaluation and then finally have operation maintenance for five years after the project.

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So now let's move into the Safety Management Plan.

Now we are moving into the main content of the session to discuss the purpose and the content that is expected in the Safety Management Plan for the Complete Trip ITS4US Program.

The overall objective is to execute planning steps in phase one to consider potential safety risks to participants, users, and others and identify concepts to address the risk in a systematic way.

Project stakeholders will be expected.

We will accept that appropriate planning has minimized the potential for injuries and for the harm of individuals and property in a way that is tailored to the project concept.

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The Safety Management Plan covers identification of safety needs across the entire project and associated plans.

Consider all the potentially affected groups beyond the traveler, including the caregiver.

The process is intended to look systematically at potential safety needs and assess potential risks.

The risks are then addressed by design, operation, training, or response as appropriate.

This includes considering both new capabilities planned as part of the deployment as well as existing processes and infrastructure which may relate.

For example, safety management planning should ensure that the complete trip concept, applications, and technologies work safely with existing infrastructure within a deployment area.

The safety management plan document will help the team to show that they looked at all the potentially safety related aspects of the project and have an adequate straight strategy solution and validate the relevant parties and stakeholders.

The draft is due 22 weeks after the kickoff, and then the final is due 26 weeks after the kickoff.

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The safety management plan has five main components.

Safety relationships defining safety management process in an approach with an input from relevant stakeholders and experts.

#2, safety scenarios. Identifying scenarios from ConOps helps ensure that safety is considered in each scenario.

Potential examples: one scenario in a proposed concept may be wayfinding tool for people using a wheelchair. Safety management planning could identify where a wayfinding plan needs to consider lack of suitable curb cuts or inaccurate data to avoid a situation where a hard curb cut barrier leads to a person being obstructed in the street or stranded, which could be a major potential hazard.

Another example could involve the use of an automated vehicle where travelers would need to enter and exit the vehicle.

Safety management planning could identify steps that need to be considered for different traveler groups covering pre boarding, entering the vehicle, safe transit and exiting to the next trip segment.

This could help plan situations where travelers may need information or guidance in transition to and from such as a slippery or uneven surface when leaving the vehicle.

#3 safety needs. Which will likely very significantly be depending on the scenario in nature of deployment.

#4 levels of safety risks. Systematic assessment of risks important to define the right safety management strategies.

Safety Operation Concepts: documenting safety operational concepts in advance reduces risks of unforeseen issues and unforeseen issues.

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As you can see from this slide the dates that we will be working on this are in May, obviously, when we are doing the training and then the final will be due in August, so we've got some time to work with it.

I believe the first draft is due at the end of June, so.

Uhm, next slide.

Like other management plans or other plans that we put together, the safety management has interdependencies as we mentioned before. This graphic illustrates some of the potential interactions across tasks that need to be considered.

Safety management will build on scenarios from the ConOps. Safety needs and strategies will need to be documented and affects planning and implementation for system and monitoring and management.

Outputs from the safety management plan will affect safety requirements, controls, and actions for several other phase one plans such as we have it in the project management, the system requirements, the enabling technologies, human use or when we get to the IRB, training plans, the integrated complete trip plan, and then the briefing at the end.

So you could see that everything we are doing here, taking the inputs from the concept of operations has many outputs that it will be able to be useful for.

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After the high-level view of task four, we are now moving to items that should be covered in the safety management plan document.

Next, slide these.

These are kind of outlined in your template that you have.

Project background.

Initial introduction should briefly provide an overview of the project focusing on the goals, outcomes, major components, applications, and deployment elements and how they interact with users.

Expect to draw from earlier work in the ConOps to provide content and help identify elements with potential safety needs.

Safety management should be tailored to what that project aims to do and associated safety.

Not all projects will have the same safety needs.

A key point is that the safety management process needs to consider the project and ensure adequate process for managing safety.

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Safety stakeholders.

Personnel and human elements are important for safety, not just the technical system elements. Clearly defined safety communications and responsibilities help to create a more robust capability.

Identification of safety needs should not be done in a vacuum. Relevant stakeholders can bring informed perspectives about specific project components, affected users, and related agencies.

Responsibilities for safety need to be clearly defined within the project team, knowledgeable about safety risk management. Safety managers and potential stakeholders should be involved.

Particular attention should be paid to safety where safety needs intersect with specific underserved communities that can have needs that differ.

Knowledge and experience with the relevant safety issues is a valuable resource that should be brought in if the project team has a gap.

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The safety risk process and approach.

Safety management should use a systematic process.

The team should be able to understand and explain their approach, demonstrating an understanding of the specifics of the project, user, and environment.

Depending on the nature of the project, established processes can be of help, particularly if there is a lack of understanding in emerging areas.

For example, a transit agency may already have a safety plan in place with the processes that can be leveraged for the planned deployment.

A safety risk management process including safety hazard identification, safety risk assessment, and safety risk mitigation, may help to think through the development of task four content for the ITS4US project.

For projects involving autonomous vehicles, UL 4600 can help to evaluate safety.

ISO 26262 ASIL, which is the automatic safety integrity level A through D.

The lowest hazards talking saying it's a low hazard would be A and the highest hazards would be D, but you will see more of that later.

It's also including the framework for safety risks for the automotive design.

Those particular topics are also covered.

There's some individual resources on those particular topics, and we have links to those in the back.

To check that the approach is appropriate, stakeholders and others with expertise should validate that the process is suited to the nature of the project and that a sufficiently broad view of the project has been taken.

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Next the approach will apply by identifying safety needs and scenarios to examine.

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Build upon the ConOps scenarios.

Work from the ConOps development can be used to identify scenarios of how users will engage with the planned system and deployment elements.

Focus should be on the safety relevant aspects and consider all user and stakeholder groups. The needs identification step is focused on completeness, looking at the entire project and reducing the likelihood that safety issues are missed.

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Safety needs and scenarios.

The safety needs and scenarios should reflect a comprehensive examination to identify potential areas where there can be a need to consider safety.

This can be viewed as a hazard identification activity. By using a systematic approach it is more likely that the needs can be captured completely.

Careful attention should be paid to each user group. Each potential need should be documented and described in the form of a scenario to explain the nature of the safety need, which could be at the system level or relating to a specific application or component.

Identifying the specific scenario in detail here will help in later assessment of risks.

They may range from the system-wide focused on safety scenarios affecting particular users to specific application scenarios that relate to a particular location, time, and deployment application.

Particularly for unfamiliar technologies or application, expertise and assistance can be of value in helping to understand the potential safety relevant scenarios.

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Assessment of safety risks.

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Safety risk assessment is considered in three steps.

Applying safety management process to assess scenarios developed in the ConOps.

Step 2, determine which scenarios may need countermeasures and controls.

And three, create safety risk assessment.

The assessment should follow the process defined above earlier as appropriate for the project.

Generally, principles such as weighing the probability of occurrence, exposure to the risk, magnitude or severity of impact, and ability to control and mitigate the impact are considerations that should be factored into the assessments.

For each scenario, the risk assessment will help to understand which warrant specific design features, countermeasures, or controls to address safety needs.

Relevant groups can help to inform judgment in estimating likelihood when limited information is available.

While there are uncertainties, a thorough assessment will help in establishing confidence that the project has taken a complete view of safety.

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This is an example from one of the CV Pilots. THEA, which is in Tampa, FL, and it's basically a chart talking about putting out the safety scenario, an individual safety scenario and assessment for the CV pilot.

So looking at the top and there's three of them, we have one for Wyoming and then one for New York City. And basically looking at this, this is probably the most comprehensive one.

It talks about the level, you know, the application level gives a little description of what the system is and then talks about some safety impacts, and then they have prevention and mitigation measures and then safety incident response plans.

This is things that the like the driver could do, and then kind of a quality management plan responding back to various references that they have for their system.

So this is a pretty comprehensive plan, you know, assessment of a risk or safety scenario for THEA.

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Now Wyoming is a little different project, so it's a little different.

They are looking at a freeway system, and here they're talking about the impact of a variable speed limits, and if somehow it goes offline and how they would, what would be the likely impacts?

And since the system with a variable speed limit has a default system, what the highway would do would be operate at the posted speed limit.

It wouldn't have any adverse effects, so they wouldn't be having any issues that they would think that the drivers would just it would be just normal day-to-day operations, but it also would be able to then monitor if there was an issue with the system and then they could send out some maintenance groups to be able to go take a look and fix it.

Now these ES&C those are considered your severity, controllability, and exposure and the levels are one, so those are pretty negligible, they're not that difficult. They're not that big of hazards, so those are things that we need to know.

And as I mentioned before, the automotive safety integrity level for this, which is QM, which is just quality management.

So, next slide.

And the safety risk assessment for New York City is just a little bit different.

It's talking about audible message signs indistinguishable from other sounds.

And this is a safety level they're talking about, the automotive safety integrity level B, which is a little more of a hazard than as opposed to A.

And then the type is a functional safety requirement. And then what the action is, what they would do in order to mitigate this safety risk.

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Safety operational concepts.

The Safety operational concepts are intended to show how the safety risks identified and assessed previously are addressed, including design, operations, and safety risk mitigations.

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Strategies to address safety needs.

Not all risks are treated equally. Some may need active design requirements and others can be monitored to detect if there is a change or other needs to be addressed.

Generally, greater risks need a little more robust strategy.

The concepts apply the principle that safety can be addressed in multiple stages of development and operation to add redundancy, but generally earlier steps are superior.

Design is one concept to address the safety need by preventing the potential safety hazard from occurring and ensuring that the system does not create new safety hazards.

Operational safety is also important and necessary when safety risk cannot be addressed in design.

Training is an important factor in making sure operational processes are executed according to plan.

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Strategies to address safety needs.

Mitigations can help in lowering level of safety impact if it occurs. Design can also consider failure modes and automatically degrade to a safe condition.

Planning for potential responses even if a significant event does not occur, is an important element of safety planning. This may include development of response protocols, training, and coordination with response entities.

Finally, to help identify patterns potentially warning attention and to assist in corrective actions, it is important to have a process for reporting and adequately documenting potential safety issues even if no injury or harm has occurred.

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The safety management plan concludes with a summary to understand the entirety of the project's safety plan and facilitate the use of plan by others in efficient manner.

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Safety risk summary. Providing a summary table to facilitate and understand the overall areas of risk, structured based on the safety management approach described in Section 2.4.

As you can see, there is an example of the summary table that will also be in your template that you run and it's basically identifying giving you the identification number.

What is the safety risk.

What's the assessment, safety operational concept strategies, factors to monitor, and overall status.

So this is something that they need to look into defining what the risk would be.

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Continuing safety planning.

As the project continues from plan to the development and testing to operation, the reporting and monitoring of safety risks is important and supported by elements in the plan.

There can be developments that warrant additional project modifications, mitigations, or response strategies.

Some of these may go beyond the project, and so communication with relevant stakeholders should be continued and coordinated, even as the personnel team may evolve.

Keeping plans updated will also assist in future operations and support a sustained and sustainable deployment.

This is also looking to make sure that you work with their local agencies especially that are developing safety countermeasures for roadway infrastructure and other levels of looking at the human element. In looking at safety, this is something that you should probably plan on doing on a yearly basis.

OK, next slide.

And then we show some useful resources.

The first one is guidance material in regard to safety management plan that was used for the CV pilots so you can click on that and it will give you some information and some templates. It is how they did this for the CV pilot.

The second one is the FTA example. It is a guide to manage safety risks and safety hazards for public transportation. Now some of those things we will require in ours and some of them are just to give you an idea.

Yeah, but it also has a good area of the safety risks for user's safety operations and training. So it has some ideas that you could use for your own safety management plan.

The third one is another FTA publication, and it assists public transportation agencies to develop their safety plans. So that is a website that you can go on and it gives you some information that you can look at.

And then the last one there is hazard and safety analysis for automated transit applications and that talks about ISO 26262 standard and gives you a little description on the research for automated bus systems using that standard.

So and then there is two other additional ones.

And that is it for today.

If you have any questions, please contact me.

I've got some experience, definitely with infrastructure, safety and some safety using automated vehicles and connected vehicles.

And if I can't answer we can definitely get you the right contact person.

And I'm going to the next slide if there are any questions.

Be happy to take those questions.